

Claims

1. A method for controlling the position of a knuckle boom crane during movements of a forest working machine, wherein the method comprises at least the following steps:
- driving the forest working machine, which comprises a front frame, a rear frame, a joint between said frames, allowing the swivelling of said frames in the lateral direction during the driving, a knuckle boom crane connected on the front frame to a swivelling device which makes it possible to swivel said crane around the vertical axis and thereby to change its rotary position;
 - changing the position of the forest working machine during the driving in such a way that the angular position between the front frame and the rear frame is changed; and
 - controlling said swivelling device automatically during the driving in such a way that when said angular position is changed, said rotary position is also changed, when said rotary position or its change is also dependent on said angular position or its change.
2. The method according to claim 1, wherein the rear frame comprises a load space which is intended for the transport of trunks, and wherein the crane or a tool connected to it can be arranged to lie on the bottom of the load space or on top of the trunks.
3. The method according to claim 1, wherein said correlation is kept such that that part of the crane which lies on the rear frame, or the tool connected to the crane and lying on the rear frame, is substantially stationary when said angular position is changed.
4. The method according to claim 2, wherein said correlation is kept such that that part of the crane which lies on the rear frame, or the tool connected to the crane and lying on the rear frame, is substantially stationary when said angular position is changed.

5 5. The method according to claim 1, wherein said correlation is kept such that that part of the crane is placed at a distance above the rear frame, or the tool connected to the crane and spaced at a distance above the rear frame, is substantially stationary when said angular position is changed.

10 6. The method according to claim 2, wherein said correlation is kept such that that part of the crane is placed at a distance above the rear frame, or the tool connected to the crane and spaced at a distance above the rear frame, is substantially stationary when said angular position is changed.

15 7. The method according to claim 1, wherein said correlation is kept such that the position and orientation of the crane, when it is placed above the rear frame, remains substantially the same with respect to the position and orientation of the rear frame, when said angular position is changed.

20 8. The method according to claim 2, wherein said correlation is kept such that the position and orientation of the crane, when it is placed above the rear frame, remains substantially the same with respect to the position and orientation of the rear frame, when said angular position is changed.

25 9. The method according to claim 1, further comprising the steps of:

- changing the position of the crane by swivelling said swivelling device which comprises first actuators which can be controlled and which produce a force effect to swivel the crane, and
- 30 - using, for the control, the control system of the forest working machine, in which said correlation is set or stored, or in which is defined that point of the rear frame, with respect to which the crane or the tool is to be substantially stationary.

35 10. The method according to claim 9, further comprising the step of changing the position of the forest working machine by swivelling said

frame joint, which comprises second actuators which can be controlled by means of said control system and which produce a force effect to swivel the frames.

5 11. The method according to claim 1, further comprising the steps of:

- changing the position of the crane by swivelling said swivelling device which comprises first actuators which can be controlled and which produce a force effect to swivel the crane,
- 10 - changing the position of the forest working machine by swivelling said frame joint which comprises second actuators which can be controlled and which produce a force effect to swivel the frames, and
- 15 - using, for the control, a pressurized medium circuit, by means of which the second actuators can be coupled, when necessary, to the first actuators in such a way that the control of the frame joint simultaneously effects control of the swivelling device, either by a constant or according to a correlation which can be set.

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12. The method according to claim 1, further comprising the steps of:

- transferring the crane, either automatically or manually, to a position which is used as a reference position, either before starting to drive or during driving, and
- 25 - changing the rotary position of the crane automatically in relation to said reference position, according to said correlation.

13. The method according to claim 1, wherein, for the control, a control system is used, which comprises a sensor defining said angular position.

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14. The method according to claim 1, wherein, for the control, a control system is used, which comprises a sensor defining said rotary position.

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15. The method according to claim 1, wherein, such an actuator of the crane, which takes care of the lifting and lowering of the crane, is simultaneously coupled to free floating.

5 16. A forest working machine which comprises:

- a front frame, a rear frame, a joint between said frames, allowing the swivelling of said frames in the lateral direction during the driving in such a way that the angular position between the front frame and the rear frame is changed,
- 10 - a knuckle boom crane connected on the front frame to a swivelling device which makes it possible to turn said crane around the vertical axis and thereby to change its rotary position;
- first actuators to change the position of said swivelling device; and
- 15 - a control system intended for controlling said actuators;
- the control system is also arranged to control said swivelling device automatically during the driving of the forest working machine in such a way that when said angular position is changed, said rotary position is also changed, when said rotary position or its change is also dependent on said angular position or its change.
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25 17. The forest working machine according to claim 16, wherein the rear frame comprises a load space which is intended for the transport of trunks, and wherein the crane or a tool connected to it can be arranged to lie on the bottom of the load space or on top of the trunks.

30 18. The forest working machine according to claim 16, wherein the control system is arranged to keep the position and orientation of the crane, or a given point of the crane, or a tool connected to the crane, substantially stationary in relation to the rear frame, when the angular position of the forest working machine is changed.

35 19. The forest working machine according to claim 17, wherein the control system is arranged to keep the position and orientation of the crane, or a given point of the crane, or a tool connected to the crane,

substantially stationary in relation to the rear frame, when the angular position of the forest working machine is changed.

5 20. The forest working machine according to claim 16, wherein it comprises second controllable actuators for changing the position of said joint, and wherein the control system comprises a pressurized medium circuit, by means of which the first actuators can be coupled, when necessary, to the second actuators in such a way that the control of the frame joint simultaneously effects control of the swivelling device, either according to a constant or a correlation which can be set.

15 21. The forest working machine according to claim 16, wherein, in the control system, said correlation is set or stored, or that part of the rear frame, with respect to which the crane or the tool is to be substantially stationary, is defined, or that position and orientation of the crane is selected, which is to be kept substantially the same with respect to the position and orientation of the rear frame, when said angular position is changed.

20 22. The forest working machine according to claim 16, wherein the control system comprises a sensor intended to define said angular position.

25 23. The forest working machine according to claim 16, wherein the crane comprises a reference position, with respect to which said rotary position is arranged to be changed, wherein the selected reference position is either a given constant position or the position in which the crane is set at the time.